9th Class 2018

Biology	Group-I	Paper-I
Time: 1.45 Hours	(Subjective Type)	Marks: 48

(Part-I)

Q.2. Write short answers to any FIVE (5) questions: (10)

(i) Differentiate between micromolecules and macromolecules with examples.

Ans **Micromolecules:**

The molecules that are with low molecular weight are called micromolecules. *e.g.*, glucose, water, etc.

Macromolecules:

The molecules that are with high molecular weight are called macromolecules. *e.g.*, starch, proteins, lipids, etc.

(ii) Define biotechnology.

Ans Biotechnology deals with the practical application of living organisms to make substances for the welfare of mankind.

(iii) Differentiate between theory and law.

Ans The hypotheses that stand the test of time (often tested and never rejected), are called theories. A theory is supported by a great deal of evidence. Productive theory keeps on suggesting new hypotheses and so testing goes on. Many biologists take it as a challenge and exert greater efforts to disprove the theory. If a theory survives such doubtful approach and continues to be supported by experimental evidence, it becomes a law or principle.

(iv) Describe deduction.

Ans The logical consequences of hypotheses is called deduction. For this purpose, a hypothesis is taken as true and expected results (deductions) are drawn from it.

(v) Write simple classification of human.

Ans Simple classification of human is:

Taxa	Human
Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Primates
Family	Hominidae
Genus	Homo
Species	H. sapiens

(vi) Write importance of biodiversity.

Ans **Importance of Biodiversity:**

1- Biodiversity provides food for human.

2- Biodiversity plays important role in making and maintaining ecosystems.

(vii) What is endocytosis? Describe its types.

Ans The process of cellular ingestion of bulky materials by the infolding of cell membrane is called endocytosis.

It has two types, and their names are phagocytosis (cellular eating) and pinocytosis (cellular drinking). In phagocytosis, cell takes in solid material while in pinocytosis, cell takes in liquid in the form of droplets.

(viii) Differentiate between magnification and resolution.

Ans **Magnification:**

It is the increase in the apparent size of an object and it is an important factor in microscopy.

Resolution:

It is the measure of the clarity of an image.

Q.3. Write short answers to any FIVE (5) questions: (10)

(i) What is alternation of generation?

Ans Plants' life cycle shows the alternation of generations.

(ii) Differentiate between chromatin and chromosomes.

Ans Chromosomes are visible only during cell division while during interphase of cell, they are in the form of fine thread-like structures known as chromatin.

(iii) Define cytokinesis.

Ans Cytokinesis is the division of cytoplasm. In animal cells, cytokinesis occurs by a process known as cleavage. A cleavage furrow develops where the metaphase plate used to be. The furrow deepens and eventually pinches the parent cell into two daughter cells.

(iv) Write down name of two enzymes.

Ans The name of two enzymes are given below:

1. Intracellular enzymes
2. Extracellular enzymes

(v) What is activation energy?

Ans All chemical reactions require activation energy. It is defined as minimum energy required to start a reaction. The need for activation energy acts as a barrier to the beginning of reaction.

(vi) Define cellular respiration.

Ans The cellular energy-yielding process is called cellular respiration. In cellular respiration, food is oxidized to CO_2 while O_2 is reduced into H_2O.

(vii) When and what discovered by Karl Lohmann?

Ans ATP (Adenosine Triphosphate) was discovered by Karl Lohmann in 1929.

(viii) Write down name of two compounds produced during respiration process.

Ans During the process of respiration, water and carbon dioxide is produced.

Q.4. Write short answers to any FIVE (5) questions: (10)

(i) Write the function of HCl and pepsin in digestion.

Ans Hydrochloric acid converts the inactive enzyme pepsinogen into its active form *i.e.*, pepsin. HCl also kills microorganisms present in food. Pepsin partially digests the protein portion of food into polypeptides and shorter peptide chains.

(ii) **What are the effects of deficiency of iodine on thyroid gland?**

Ans If sufficient iodine is not available in a person's diet, thyroid gland becomes enlarged and it results in swelling in neck. This condition is known as goitre.

(iii) **What is night blindness?**

Ans Night blindness is the inability of the eye to adapt to reduced illumination, leading to a complaint of not being able to see at night.

(iv) **Differentiate between assimilation and absorption.**

Ans **Assimilation:**

Conversion or incorporation of absorbed simple food into the complex substances constituting the body is called assimilation.

Absorption:

Diffusion of digested food into blood and lymph is called absorption.

(v) **Transpiration may be a harmful process. How?**

Ans Transpiration may be a harmful process in the sense that during the conditions of drought, loss of water from plant, results in serious desiccation, wilting and often death.

(vi) **How is plasma separated from blood?**

Ans Blood is taken from an artery and an anticoagulant (chemical that inhibits blood clotting) is mixed in it. After about 5 minutes, plasma separates from blood cells, which settle down.

(vii) **Briefly describe the function of pericardial fluid.**

Ans Heart is enclosed in a sac known as pericardium. There is a fluid, known as pericardial fluid, between pericardium and heart walls. It reduces friction between pericardium and heart, during heart contractions.

(viii) **How does Aedes mosquito spread dengue fever?**

Ans Dengue is spread through the bite of the female mosquito (Aedes argypti). The mosquito becomes infected

when it takes the blood of a person infected with the virus. After one week, the mosquito can then transmit the virus while biting a healthy person. Dengue cannot be spread directly from person to person.

(Part-II)

Note: Attempt any TWO (2) questions.

Q.5.(a) Which professions can be adopted after biological studies? Explain any five. (5)

Ans The following are the careers that a student of biology can plan to adopt:

(i) Medicine / Surgery:

The profession of medicine deals with diagnosis and treatment of diseases in human. In surgery the parts of the body may be repaired, replaced or removed, for example the removal of stones through renal surgery, transplantation of kidney, liver etc. Both these professions are studied in the same basic course (MBBS) and then students go for specializations.

(ii) Fisheries:

Fisheries is the professional study of fish production. There are departments in Pakistan where professionals of fisheries are employed. They serve for enhancing the quality and quantity of fish production. In Pakistan, this profession can be adopted after the bachelor or masters level study of zoology and fisheries.

(iii) Animal husbandry:

It is the branch of agriculture concerned with the care and breeding of domestic animals (livestock) *e.g.*, cattle, sheep, etc. Professional courses in animal husbandry can be adopted after the higher secondary education in biology.

(iv) Farming:

It deals with the development and maintenance of different types of farm. For example, in some farms, animal breeding technologies are used for the production

of animals which are better protein and milk source. In poultry farms, chicken and eggs are produced. Similarly in fruit farms, different fruit yielding plants are grown. A student who has gone through the professional course of agriculture, animal husbandry or fisheries etc. can adopt this profession.

(v) Forestry:

In forestry, professionals look after natural forests and advises to the government for planting and growing artificial forests. Many universities offer professional courses in forestry after the higher secondary education in biology or after bachelor level study of zoology and botany.

(b) Explain three types of plastids. (4)

Ans Plastids:

Plastids are also membrane-bound organelles that only occur in the cells of plants and photosynthetic protists (algae). They are of three type *i.e.,* chloroplasts, leucoplasts and chromoplasts.

Chloroplast:

Like mitochondria, chloroplast is also bound by a double membrane. The outer membrane is smooth while the inner membrane gives rise to sacs called thylakoids. The stack of thylakoids is called granum. Grana float in the inner fluid of chloroplast *i.e.,* stroma. Chloroplasts are the sites of photosynthesis in eukaryotes. They contain chlorophyll and associated pigments. These pigments are present in the thylakoids of grana.

Chromoplast:

The second type of plastids in plant cells are chromoplasts. They contain pigments associated with bright colors and are present in the cells of flower petals and fruits. Their function is to give colors to these parts and thus help in pollination and dispersal of fruit.

Leucoplasts are the third type of plastids. They are colourless and store starch, proteins and lipids. They are present in the cells of those parts where food is stored.

Q.6.(a) Describe characteristics of enzymes (any five). (5)

Ans Following are the characteristics of enzymes which make them specific for substrates:

1. Enzymes are specific in their function.
2. Each enzyme acts on a specific substrate. For example, proteases only act on proteins.
3. Similarly, the lipases act on lipids only and convert them into fatty acids and glycerol.
4. The specificity of enzymes is determined by the shapes of their active sites.
5. The active site has a specific geometrical shape, due to which each enzyme fits to a specific substrate.

(b) Describe different steps of light reactions. Also draw Z-scheme. (4)

Ans **Light Reactions:**

The summary of the events of light reactions is as follows:

(i) When chlorophyll molecules absorb light, their energy level increases and their electrons are emitted.

(ii) Electrons are passed to electron transport chain to produce ATP.

(iii) Light also breaks water molecule (photolysis) and oxygen is released. The hydrogen atoms of water give electrons to chlorophyll and become ions.

(iv) The electrons of chlorophyll, after the production of ATP, and the hydrogen ions of water are used for the reduction of $NADP^+$ into NADPH.

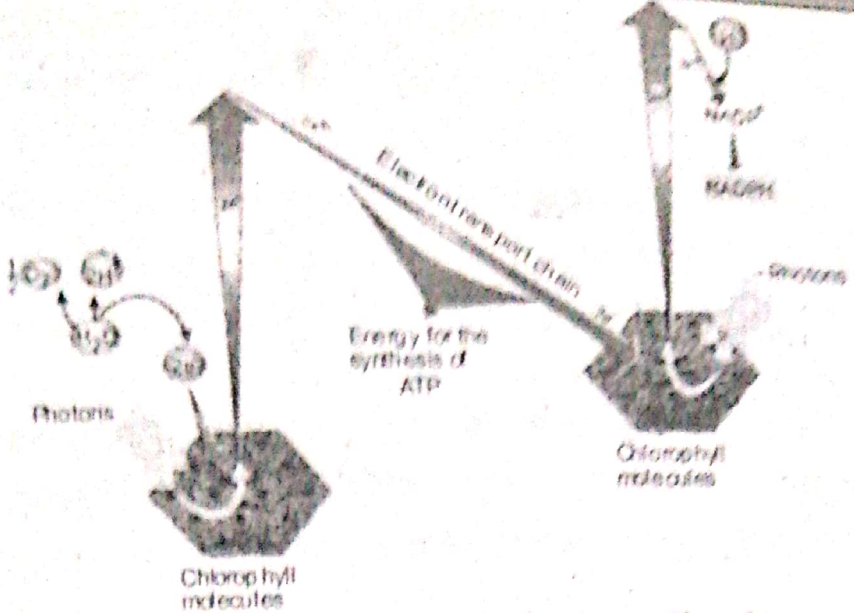

Fig. Light reactions of photosynthesis.

Q.7.(a) Explain the importance of water and dietary fibres in food. (5)

Ans In human body, there is about 60% water. Water plays an essential role in human body. It provides a medium for various life sustaining reactions. Water also functions as the environment in which water soluble food stuff is absorbed in the intestines and waste products are eliminated from the body. Water also maintains body temperature through evaporation as in sweating.

As for dietary fibres, these relieve constipation which is the cause of various other diseases. The soluble dietary fibres (found in barley, oat, fruits, vegetables etc.) reduce cholesterol and sugar level in blood. On the other hand, the insoluble fibres (found in wheat bran, cereals, skin of many fruits and vegetables) speed up the movement of carcinogens (cancer causing agents) from the intestine.

(b) Compare the structure and function of artery and vein. (4)

Ans **Arteries:**

Arteries are the blood vessels that carry blood away from heart. In adults, all arteries with the exception of the pulmonary arteries, carry oxygenated blood.

The structure of arteries is well-adapted to their function. The walls of an artery are composed of three layers. The outermost layer is made of connective tissue. The middle one is made up of smooth muscles and elastic tissue while the innermost layer is made up of endothelial cells. The hollow internal cavity in which blood flows is called lumen.

When arteries enter body organs, they divide into smaller vessels known as arterioles. Arterioles enter tissues and divide into capillaries.

Veins:

A vein is a blood vessel that carries blood towards heart. In adults, all veins with the exception of pulmonary veins, carry deoxygenated blood.

Veins are also well-adapted to their function. The walls of vein are composed of the same three layers as are present in artery wall, with the difference that the middle layer of vein has less smooth muscles and elastic tissue as compared to artery. So the middle layer of vein is comparatively thin. The lumen of the veins is broader than that of arteries.

In a tissue, capillaries join to form small venules, which join to form veins. Most veins have flaps called valves that prevent the backflow of blood.

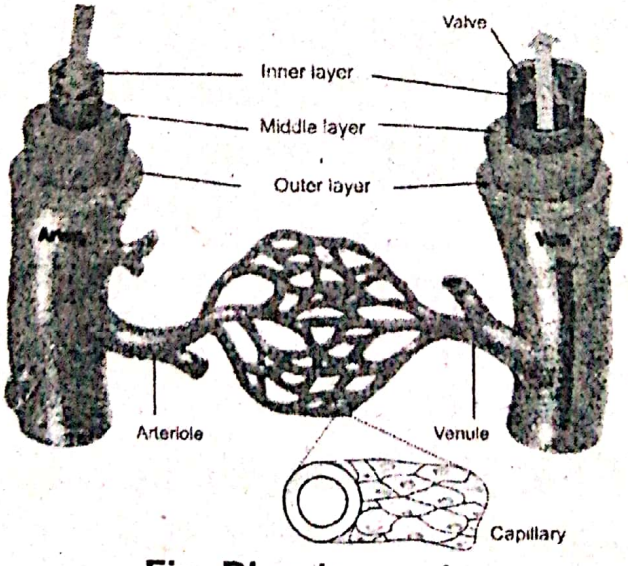

Fig. Blood vessels.